Application No.: 10/634,304   Docket No.: MWS-030

REMARKS

In this Response, claims 10, 13, 17, 18 and 40 have been amended. Claims 1-47 are currently pending, of which claims 1, 21, 28 and 37 are independent. No new matter has been added.

I. Objections to the Specification

The Examiner objected to the disclosure because of informalities identified in the office action (office action, paragraphs 3-4). Applicants have amended the specification to address the issues raised by the Examiner. No new matter has been added by these amendments. The amendments are itemized below.

On page 4, line 39 and on page 9, line 30, the word "Java" has been amended to read "JAVA."

On page 10, lines 26 and 27, "output equation processing unit 350" has been amended to read "output equation processing unit 330."

Accordingly, Applicants request the Examiner to reconsider and to withdraw the objection to the specification.

II. Objections to the Claims

The Examiner objected to claim 40 because of the lack of a period at the end of the claim (office action, paragraph 5). Applicants have amended claim 40 to add a period at the end of the claim and request the Examiner to reconsider and to withdraw the objection to claim 40.

III. Summary of Rejections

Claim 35 stands rejected under 35 U.S.C. §112, first paragraph.

Claims 10-13 and 17-18 stand rejected under 35 U.S.C. §112, second paragraph.

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Claims 1-3, 5-7, 21-23, 26-33, 36-41 and 44-47 stand rejected under 35 U.S.C. §102(b) as being anticipated by Denk et al. (US 2001/0025292).

Claims 4, 24, 25, 34, 42 and 43 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Denk et al. (US 2001/0025292) in view of Gay (US 5,677,951).

Claims 8, 19 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Denk et al. (US 2001/0025292) in view of "AutoCode Solutions."

Claims 9-18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Denk et al. (US 2001/0025292) in view of "AutoCode Solutions" and further in view of "Digital Filter Solutions."

These rejections will be discussed separately below.

IV. Claim Rejections under 35 U.S.C. §112

A. Claim 35

The Examiner rejected claim 35 under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement (office action, paragraph 6). Applicants respectfully traverse the 35 U.S.C. §112 rejection for at least the reasons set forth below.

Claim 35 recites:

> "The medium of claim 28 further comprising the step of inheriting the state of the object from an abstract class."

The Examiner asserted:

> "Claim 35 recites the limitation of inheriting the state of the object from an abstract class. On page 11, 3rd paragraph, for example, "... The parent class is not suitable for instantiation and used to abstract out incomplete set of features...." In essence, an abstract cannot be used for instantiation, so it is impossible to have an object from an abstract class," (office action, paragraph 6).

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Applicants respectfully disagree with the Examiner's assertion.

Claim 35 recites "*inheriting* the state of the object from an abstract class." The claim language does not require that the object be instantiated directly from the abstract class, just that the state of the object is inherited from the abstract class. The object recited in claim 35 is a member of a child class that inherits properties/methods from an abstract base class, as set forth in the discussion below.

On page 11, paragraph 3, the specification discusses that although a parent class may not be suitable for instantiation, the parent class may abstract out sets of features. The specification also states on page 11, paragraph 1: "The DFILT class 430 enables the instantiation of discrete time filter objects that operate on a sample-by-sample, block-by-block or frame-by-frame basis." The above excerpt discusses that objects may be instantiated from the DFILT class. On page 12, paragraph 1, the specification presents an example of the DFILT class inheriting features from an abstract class: "The DFILT class 430 has methods 411 that extend the AbstractFilter class 420, the parent class of the DFILT class 430.... The DFILT class 430 inherits from the AbstractFilter class 420 the FilterStructure 421, States 423 and ResetStates 425 properties along with other properties that define the filter." As disclosed in the above excerpts, the DFILT class which may instantiate filter objects, inherits states from the abstract class AbstractFilter. Based on the above disclosure in the specification, Applicants respectfully submit that the specification describes the step of inheriting states of an object from an abstract class.

In view of the above arguments, Applicants respectfully request reconsideration of the outstanding rejection of claim 35.

B.   Claims 10-13 and 17-18

The Examiner rejected claims 10-13 and 17-18 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention (office action, paragraph 7).

Regarding claims 10-13, the Examiner asserted: "Claims 10 and 13 recite the limitation "the simulation environment" in "the context of the simulation environment". There is

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insufficient antecedent basis for this limitation in the claim," (office action, paragraph 7). In this Response, Applicants have amended claims 10 and 13 to replace "the simulation environment" with "a simulation environment." Applicants respectfully request reconsideration of the outstanding rejection of claims 10-13 under 35 U.S.C. §112, second paragraph.

Regarding claims 17-18, the Examiner asserted: "the phrase "or other" renders the claims indefinite because the claims include elements not actually disclosed, thereby rendering the scope of the claims unascertainable," (office action, paragraph 7). In this Response, Applicants have amended claims 17-18 to remove the phrase "or other." Applicants respectfully request reconsideration of the outstanding rejection of claims 17-18 under 35 U.S.C. §112, second paragraph.

V. Claim Rejections under 35 U.S.C. §102

The Examiner rejected claims 1-3, 5-7, 21-23, 26-33, 36-41 and 44-47 under 35 U.S.C. §102(b) as being anticipated by US Publication Number 2001/0025292 to Denk et al ("Denk"). Applicants respectfully traverse the rejections for the reasons set forth below.

A. Claim 1

Independent claim 1 recites:

> "In a computer system, a method for implementing and using a filter object which generates an output in response to an input of the filter object, wherein the output of the filter object depends on the input and a state of the filter object, wherein the state of the filter object includes a minimum amount of information necessary to determine the output of the filter object, the method comprising:
> providing the filter object, the filter object being represented by equations performed to generate the output in response to the input of the filter object, the equations including the state of the filter object; and
> *retaining the state of the filter object,*
> wherein the filter object is implemented and used in a first dynamically typed text-based programming environment." [emphasis added]

Denk pertains to rounding techniques. More specifically, Denk discusses methods and apparatus that reduce the precision of an input signal value having a first precision to an output

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signal value having a second, lesser precision in a manner that greatly reduces, or substantially cancels, a precision reduction error signal. By combining the input signal with a selectable bias, responsive to a pre-selected threshold rounding state, the rounding methods and apparatus provide an output signal that is substantially free of precision reduction error bias. In addition, where it is desired to produce a pre-selected signal offset, values for the selectable bias can be assigned to generate the offset. See Denk, paragraph [0029].

Applicants respectfully submit that Denk fails to disclose every feature of claim 1. Therefore, Denk does not support a valid 35 U.S.C. §102(b) rejection of claim 1. For example Denk does not disclose or suggest at least the following feature of claim 1: "*retaining* the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment."

Denk does not disclose "*retaining* the state of the filter object," as recited by claim 1. With regard to states, Denk indicates: "Typically, RTC rounding is used in prior art precision reduction operations resulting from a threshold rounding state. According to the present invention, it is preferred to combine a selectable bias value α with the input signal Y 200, to produce the reduced precision output signal 220, upon the occurrence of a threshold rounding state, e.g., when loss portion 240 exactly represents a "half-value"." See Denk, paragraph [0043]. The Examiner points to the following language at paragraph [0070] in Denk as disclosing the retention of the state of a Filter object (office action, paragraph 8):

> "The Matlab® integrated technical computing environment can be used to model signal processing methods, and also is well known to skilled artisans. The Matlab® environment is produced by The MathWorks, Natick, Mass. Selectable bias rounding of step 730 can be modeled in the Matlab Environment by implementing standard rounding and then performing a correction."

The above excerpt of Denk discusses rounding of signal values in the MATLAB environment, and discusses that selectable bias rounding can be modeled by implementing standard rounding and then performing a correction. The threshold rounding state discussed in Denk is a *value of the loss portion of a rounding operand* and is not the state of a filter object as recited in Applicants' claim 1. Denk fails to disclose the use of a filter object or the state of a

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filter object. Denk also fails to discuss the *retaining* of the state of a filter object. For at least the reasons presented above, Applicants respectfully request reconsideration and allowance of claim 1.

B. Claims 2-3 and 5-7

Claims 2-3 and 5-7 depend from independent claim 1 and, as such, incorporate all of the features of claim 1. Accordingly, claims 2-3 and 5-7 are allowable for at least the reasons set forth above with respect to claim 1. Applicants respectfully request reconsideration and allowance of claims 2-3 and 5-7.

C. Claim 21

Independent claim 21 recites:

> "In a computer-implemented system, a method for generating an output of the system in response to an input of the system, the method comprising the steps of:
> specifying a state of the system that includes a minimum amount of information that is necessary to determine the output of the system;
> retaining *the state of the system* in a memory;
> providing to the system the state of the system retained in the memory; and
> determining the output of the system depending on the *input and a state of the system,*
> wherein the method is implemented in a dynamically typed text-based programming environment." [emphasis added]

Applicants respectfully submit that Denk fails to disclose at least the following features of claim 21: "retaining *the state of the system* in a memory," and "determining the output of the system depending on the input *and a state of the system*, wherein the method is implemented in a dynamically typed text-based programming environment."

The Examiner points to the following language at paragraph [0053] in Denk as disclosing the above features of claim 21 (office action, page 6):

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"Initially, the rounding operand is assigned... in a manner consistent with the reduced precision desired for output signal..."

Denk does not disclose the aforementioned features of claim 21. The excerpt of Denk identified by the Examiner discusses determining the rounding operand based on the value of unassigned input signal X. In Denk, the rounding operand is dependent upon the input signal, and does not represent a state of the system (Denk, paragraph [0053]). In contrast, claim 21 recites retaining *the state of the system* in a memory and the determination of the output of a system based on the input *and a state of the system*. Denk fails to disclose retaining the state of a system in memory or the use of the state of a system in determining the output of the system.

For at least these reasons, Applicants respectfully request reconsideration and allowance of claim 21.

D. Claims 22-23 and 26-27

Claims 22-23 and 26-27 depend from independent claim 21 and, as such, incorporate all of the features of claim 21. Accordingly, claims 22-23 and 26-27 are allowable for at least the reasons set forth above with respect to claim 21. Applicants respectfully request reconsideration and allowance of claims 22-23 and 26-27.

E. Claim 28

Independent claim 28 recites:

"A computer readable medium holding instructions executable in a computer that provides a dynamically typed text-based programming environment, wherein the computer generates an output of an object in response to an input of the object, comprising:
        providing a class, the object being an instance of the class;
        specifying a state of the object that includes a minimum amount of information that is necessary to determine the output of the system, the state being a property of the object; and
        determining the output of the object depending on the input *and the state of the system*." [emphasis added]

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Applicants respectfully submit that Denk fails to disclose at least the following feature of claim 28: "determining the output of the object depending on the input *and the state of the system,*" as discussed above in connection with claim 21, and therefore claim 28 is patentable for at least this reason. Applicants respectfully request reconsideration and allowance of claim 28.

F. Claims 29-33 and 36

Claims 29-33 and 36 depend from independent claim 28 and, as such, incorporate all of the features of claim 28. Accordingly, claims 29-33 and 36 are allowable for at least the reasons set forth above with respect to claim 28. Applicants respectfully request reconsideration and allowance of claims 29-33 and 36.

G. Claim 37

Independent claim 37 recites:

"A system for implementing a filter object which generates an output in response to an input of the filter object, wherein the output of the filter object depends on the input and a state of the filter object, wherein the state of the filter object includes a minimum amount of information necessary to determine the output of the filter object, the method comprising:
          a memory for *retaining the state of the filter object*; and
          a state equation processing unit for generating a new state of the filter object *based on the state of the filter object* retained in the memory and the input of the filter object;
          wherein the filter object is implemented and used in a first dynamically typed text-based programming environment." [emphasis added]

Applicants respectfully submit that Denk fails to disclose at the least following features of claim 37: "a memory for *retaining the state of the filter object,*" and "a state equation processing unit for generating a new state of the filter object *based on the state of the filter object* retained in the memory and the input of the filter object." As will be explained in more detail below, various aspects of these features are not disclosed by Denk.

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The Examiner points to the following language at paragraph [0031] in Denk as disclosing the above features of claim 37 (office action, paragraph 8):

> "Symbolically, processor 120 can be represented by the equation {circumflex over (Z)}=Z+e. It is clear that precision reduction error e is a function of the difference between output signal {circumflex over (Z)} and input signal Z. e={circumflex over (Z)}-Z."

The aforementioned paragraph in Denk discusses the determination of a reduced precision output signal based on an input signal and a precision reduction error. In contrast, claim 37 recites "a memory for *retaining the state of the filter object*," and "generating a new state of the filter object *based on the state of the filter object* retained in the memory and the input of the filter object." The processor of paragraph [0031] in Denk does not retain the state of the system and does not include a filter object, as required by claim 37, and the reference therefore fails to disclose the above features of claim 37.

For at least the reasons presented above, Applicants respectfully request reconsideration and allowance of claim 37.

H.   Claims 38-41 and 44-47

Claims 38-41 and 44-47 depend from independent claim 37 and, as such, incorporate all of the features of claim 37. Accordingly, claims 38-41 and 44-47 are allowable for at least the reasons set forth above with respect to claim 37. Applicants respectfully request reconsideration and allowance of claims 38-41 and 44-47.

VI.   Claim Rejections under 35 U.S.C. §103

A.   Claims 4, 24, 25, 34, 42 and 43

The Examiner rejected claims 4, 24, 25, 34, 42 and 43 under 35 U.S.C. §103(a) as being unpatentable over Denk in view of US Patent No. 5,677,951 to Gay ("Gay") (office action, paragraph 9). Applicants respectfully traverse the rejections for the reasons set forth below.

Denk has been summarized above.

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Gay discusses a dynamically regularized fast recursive least squares (FRLS) adaptive filter and method which provide O(N) computational complexity and which have dynamically adjusted regularization in real-time without requiring restarting the adaptive filtering. The adaptive filter includes a memory for storing at least one program, including a dynamically regularized fast recursive least squares (DR-FRLS) program; and a processor which responds to the DR-FRLS program for adaptively filtering an input signal and for generating an output signal associated with the input signal. See Gay, abstract.

i) Claim 4

Claim 4 depends from independent claim 1. Applicants respectfully submit that Denk and Gay, alone or in any reasonable combination, fail to disclose or suggest all of the features of claim 4.

Applicants respectfully submit that Denk and Gay fail to disclose or suggest at least the following feature of claim 4: "retaining the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment."

As discussed previously, Denk fails to disclose or suggest the aforementioned feature of claim 4. The teachings of Gay do not supplement Denk in such a way as to cure Denk's failure to disclose or suggest the above feature of claim 4.

The Examiner points to the discussion of "a restart signal" at column 3, lines 5-16 of Gay as disclosing "the step of resetting the state of the filter object retained in the filter object," as recited by claim 4 (office action, paragraph 9). Applicants respectfully disagree with the Examiner's position because a restart signal is not the equivalent to the *state of a filter object*. In addition, Gay fails to disclose or suggest *the retaining of the state* of a filter object in a dynamically typed text-based programming environment. In contrast, claims 1 and 4 both recite: "retaining the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment."

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For at least the reasons presented above, Denk and Gay, alone or in any reasonable combination, do not disclose or suggest the features of claim 4. Therefore, Denk and Gay do not support a valid 35 U.S.C. §103(a) rejection of claim 4.

ii)   Claims 24-25

Claims 24 and 25 depend from independent claim 21. Applicants respectfully submit that Denk and Gay, alone or in any reasonable combination, fail to disclose or suggest all of the features of claims 24 and 25. More particularly, Applicants respectfully submit that Denk and Gay fail to disclose or suggest at least the following feature of claim 21 upon which claims 24 and 25 are dependent: "determining the output of the system depending on the input and a *state* of the system, wherein the method is implemented in a dynamically typed text-based programming environment."

As discussed previously with respect to claim 4, the cited combination of Denk in view of Gay fails to disclose or suggest determining the output of a system based on an input and a state of the system. Denk and Gay fail to disclose still other features of claims 24 and 25. For example, Denk and Gay fail to disclose or suggest the "state of the system retained in memory" as further required by claims 24 and 25. For at least the above reasons, Applicants request reconsideration of claims 24 and 25.

iii) Claim 34

Claim 34 depends from independent claim 28. Applicants respectfully submit that Denk and Gay, alone or in any reasonable combination, fail to disclose or suggest all of the features of claim 34.

Applicants respectfully submit that Denk and Gay fail to disclose or suggest at least the following feature of claim 34: "determining the output of the object depending on the input *and the state of the system.*"

As discussed previously, neither Denk nor Gay disclose or suggest the aforementioned feature of claim 34. Gay fails to disclose or suggest determining the output of an object based

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on the input and *state* of the system in a dynamically typed text-based programming environment, as required by claim 34. Therefore, Denk and Gay, alone or in any reasonable combination, do not support a valid 35 U.S.C. §103(a) rejection of claim 34. Accordingly, Applicants request reconsideration and allowance of claim 34.

iv) Claims 42-43

Claims 42 and 43 depend from independent claim 37. Applicants respectfully submit that Denk and Gay, alone or in any reasonable combination, fail to disclose or suggest all of the features of claims 42 and 43.

For example, Denk and Gay fail to disclose or suggest at least "a state equation processing unit for generating a new *state of the filter object based on the state of the filter object retained in the memory and the input of the filter object*" as required by claims 42 and 43.

As discussed previously, the cited combination of Denk in view of Gay fails to disclose or suggest either the use of a filter object, a state of a filter object or the retention in memory of the state of a filter object. Therefore, Denk and Gay do not support a valid 35 U.S.C. §103(a) rejection of claims 42 and 43. Accordingly, Applicants request reconsideration and allowance of claims 42 and 43.

B. Claims 8, 19 and 20

The Examiner rejected claims 8, 19 and 20 under 35 U.S.C. §103(a) as being unpatentable over Denk in view of "AutoCode Solutions" ("AutoCode") (office action, paragraph 10). Applicants respectfully traverse the rejections for the reasons set forth below.

Denk has been summarized above.

AutoCode discusses the capability to generate C code for a digital filter in the same form and precision, up to 16 digits, that is specified in a Z transform. The code is compatible with any standard C or C++ compiler. The filter may be initialized at any point in time to any value,

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except that pass band filters only initialize to zero. The filter starts with an initial value of zero at the first call. See AutoCode, "General Information."

Claims 8, 19 and 20 depend from independent claim 1. Applicants respectfully submit that Denk and AutoCode, alone or in any reasonable combination, fail to disclose or suggest all of the features of claims 8, 19 and 20.

Applicants respectfully submit that Denk and AutoCode fail to disclose or suggest at least the following feature of claims 8, 19 and 20: "retaining the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment."

Denk has been discussed extensively above. As previously discussed, Applicants respectfully submit that Denk fails to disclose or suggest all of the features of claims 8, 19 and 20. The teachings of AutoCode do not supplement Denk in such a way as to cure the failure to recite the above feature of claims 8, 19 and 20. AutoCode discusses generation of C code for a digital filter. AutoCode fails to disclose or suggest *retaining the state* of a filter object in a dynamically typed text-based programming environment. In contrast, claims 1, 8, 19 and 20 all recite: "retaining the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment." AutoCode does not cure the shortcomings of Denk with respect to claims 8, 19 and 20. Therefore, a combination of Denk and AutoCode does not support a valid 35 U.S.C. §103(a) rejection of claims 8, 19, and 20. Applicants respectfully request reconsideration and allowance of claims 8, 19, and 20 for at least the reasons presented above.

C. Claims 9-18

The Examiner rejects claims 9-18 under 35 U.S.C. §103(a) as being unpatentable over Denk in view of AutoCode (office action, paragraph 15), and further in view of "Digital Filter Solutions" ("DFS"). Applicants respectfully traverse the rejections for the reasons set forth below.

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Claims 9-18 depend from independent claim 1. Applicants respectfully submit that Denk, AutoCode and DFS, alone or in any reasonable combination, fail to disclose or suggest all of the features of claim 1, notably: *"retaining the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment."*

Denk and AutoCode have been discussed above. DFS discusses providing solutions for digital filters and was cited by the Examiner as disclosing the "implementing of a bench test or filter analysis" (see Office Action, page 16). The teachings of DFS do not cure the shortcomings of Denk and AutoCode with respect to the features of claims 9-18. For example, DFS fails to disclose or suggest *retaining* the state of a filter object in a dynamically typed text-based programming environment, as required by claims 9-18. Therefore, a combination of Denk, AutoCode and DFS does not support a valid 35 U.S.C. §103(a) rejection of claims 9-18. For at least the reasons presented above, Applicants respectfully request reconsideration and allowance of claims 9-18.

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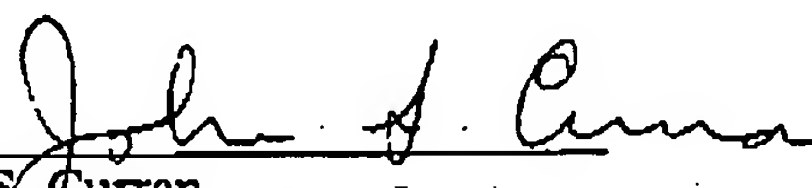
CONCLUSION

In view of the foregoing claim amendments and remarks, Applicants believe that all claims should be passed to issuance.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. MWS-030. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. §1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

Should the Examiner feel that a teleconference would expedite the prosecution of this application, the Examiner is urged to contact the Applicants' attorney at (617) 227-7400.

Dated: March 21, 2007   Respectfully submitted,

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